A Numerical Study of Transient, Thermally-Conductive Solar Wind

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A numerical analysis of transient solar wind starting at the solar surface and arriving at 1 AU is performed by an implicit numerical method. The model hydrodynamic equations include thermal conduction term for both steady and unsteady simulations. Simulation results show significant influence of thermal conduction on both steady and time-dependent solar wind. Higher thermal conduction results in higher solar wind speed, higher temperature but lower plasma density at 1 AU. Higher base temperature at the solar surface gives lower plasma speed, lower temperature but higher density at 1 AU. Higher base density, on the other hand, gives lower velocity, lower temperature but higher density at 1 AU.